

# Deadly tornadoes in Poland from 1820 to 2015

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Tazarek M., and J. Gromadzki, 2016: Deadly tornadoes in Poland from 1820 to 2015. *Mon. Wea. Rev.*, **145**, 1221-1243.

## Key findings

- Historical sources contain dozens of tornado reports, sometimes with information precise enough to reconstruct tornado damage paths.
- An average of 1-2 killer tornadoes and 5 fatalities occur each decade in Poland.

## Overview

For a long time, tornadoes in Poland were regarded by society as strange and rare phenomena reserved mainly for the territory of United States. Doswell (2003) described this situation as a self-fulfilling prophecy, in which denying the existence of tornadoes resulted in no record-keeping of such events. However, tornado databases are likely to be more consistent over time, especially for intense spectacular events that leave behind significant damage to property. This concerns especially deadly tornado cases that attract more public attention and are usually better documented in media reports (Tazarek and Brooks 2015). Using historical sources derived from 12 Polish digital libraries, an investigation into previously unknown killer tornado events in Poland was carried out. Although some of the cases took place more than 150 years ago, it was still possible to identify tornado phenomena and the course of such events.

**Table 1.** List of deadly tornadoes in Poland from 1820 to 2015.

No.	Date	Nearest city	Rating	Time (UTC)	Pathlength	Path width	Motion	Deaths	Credibility	Cause of death
1	30 Jun 1829	Turzyn	F1/F2	1700	10 km	800 m	No data	4	Case confirmed	4 drowned in an overturned boat
2	15 May 1830	Szamatuly	F2/F3	Evening	20 km	No data	SE-NW	1	Case confirmed	1 crushed in a building
3	27 Jun 1833	Wegrzynów	F2/F3	Daytime	16 km	No data	SW-NE	2	Case uncertain	2 crushed in a building
4	12 May 1851	Charsznica	F2/F3	Daytime	No data	No data	SW-NE	1	Case confirmed	Unknown causes
5	18 Jul 1851	Bobrowniki	F2/F3	1430	15 km	No data	SW-NE	3	Case uncertain	Unknown causes
6	18 Jul 1851	Szopienice	F2/F3	Daytime	No data	No data	No data	10	Case uncertain	10 crushed in a building
7	1 Jun 1853	Wieliczka	F1/F2	1600	5 km	50 m	SW-NE	1	Case confirmed	Unknown causes
8	29 Jul 1862	Zerków	F3/F4	1400	8 km	2000 m	SW-NE	3	Case fully verified	2 crushed in a building, 1 lifted
9	31 May 1866	Jarutły	F3/F4	1400	7 km	No data	SW-NE	7 (19?)	Case fully verified	7 lifted, 12 people missing
10	19 Jun 1871	Tuchola	F2/F3	No data	No data	No data	SW-NE	5	Case uncertain	5 crushed in a building
11	12 Aug 1880	Niecsławowie	F2/F3	Daytime	No data	No data	SE-NW	1	Case uncertain	1 crushed in a building
12	15 Aug 1880	Rebowo	F1/F2	1430	7 km	No data	NE-SW	1	Case confirmed	Case confirmed
13	9 Aug 1881	Wronczyn	F1/F2	Daytime	No data	No data	W-E	2	Case uncertain	2 crushed by falling debris
14	13 Jul 1884	Gostycyn	F1/F2	1730	No data	No data	W-E	1	Case uncertain	1 crushed by a falling debris
15	14 May 1886	Krosno Odrzańskie	F3/F4	1230	30 km	1200 m	SW-NE	13	Case fully verified	5 lifted, 3 crushed in a building, 5 drowned in an overturned boat
16	13 Aug 1888	Walewice	F2/F3	1530	25 km	No data	W-E	2	Case confirmed	Unknown causes
17	24 Jul 1890	Modla	F2/F3	1300	35 km	200 m	W-E	3 (4?)	Case fully verified	3 crushed in a building, 1 person missing
18	30 Jul 1895	Rudka	F2/F3	Daytime	No data	No data	W-E	1	Case uncertain	1 crushed by a falling tree
19	7 Jul 1897	Pytowice	F2/F3	Daytime	30 km	No data	W-E	3	Case confirmed	1 crushed by a falling debris, 1 lifted in a droshky, 1 unknown causes
20	27 Jun 1905	Kamienica	F2/F3	Daytime	3 km	No data	N-S	3	Case confirmed	Unknown causes
21	30 Jul 1912	Pobikry	F2/F3	No data	No data	No data	SW-NE	1	Case uncertain	1 crushed in a building
22	15 Aug 1922	Jedrzewo	F2/F3	No data	No data	No data	W-E	8	Case uncertain	8 lifted
23	27 Apr 1926	Rowska	F2/F3	Daytime	10 km	No data	S-N	2	Case uncertain	2 lifted
24	4 Jul 1928	Jakoty	F3/F4	1200	No data	No data	SW-NE	2	Case uncertain	2 lifted
25	20 Jul 1931	Lublin	F4/F5	1700	20 km	300 m	SW-NE	6	Case fully verified	3 lifted, 2 crushed by a falling debris, 1 lifted in a droshky
26	29 Jul 1936	Łążyń	F2/F3	1200	15 km	No data	SW-NE	4	Case confirmed	4 crushed in a building
27	21 Jul 1940	Borzymy	F2/F3	Daytime	10 km	600 m	SW-NE	1	Case uncertain	1 crushed in a building
28	13 Jun 1946	Zabrzeg	F1/F2	Daytime	No data	No data	S-N	1	Case uncertain	Unknown causes
29	20 Aug 1946	Stronie Śląskie	F3/F4	Evening	20 km	1000 m	SW-NE	1	Case confirmed	Unknown causes
30	15 May 1958	Rawa Mazowiecka	F3/F4	1600	20 km	800 m	SW-NE	2	Case fully verified	Unknown causes
31	16 May 1958	Nowe Miasto nad Pilicą	F3/F4	1530	13 km	200 m	SW-NE	1	Case fully verified	Unknown causes
32	23 Jul 1958	Swaty	F1/F2	No data	No data	No data	S-N	2	Case uncertain	Unknown causes
33	20 May 1960	Przeworsk	F2/F3	1200	No data	No data	SW-NE	3	Case uncertain	1 crushed in a derailed train, 1 crushed by a falling tree, 1 unknown causes
34	20 May 1960	Żulice	F2/F3	1300	No data	No data	W-E	1	Case uncertain	1 crushed in a building
35	8 Jul 1996	Suchońdź	F1/F2	1700	No data	No data	S-N	1	Case uncertain	1 crushed in a building
36	15 Aug 2008	Rusnodobice	F3	1530	60 km	1000 m	SW-NE	2	Case fully verified	1 crushed in a building, 1 crushed by a falling tree
37	14 Jul 2012	Wycinki	F3	1500	42 km	700 m	SW-NE	1	Case fully verified	1 crushed in a building

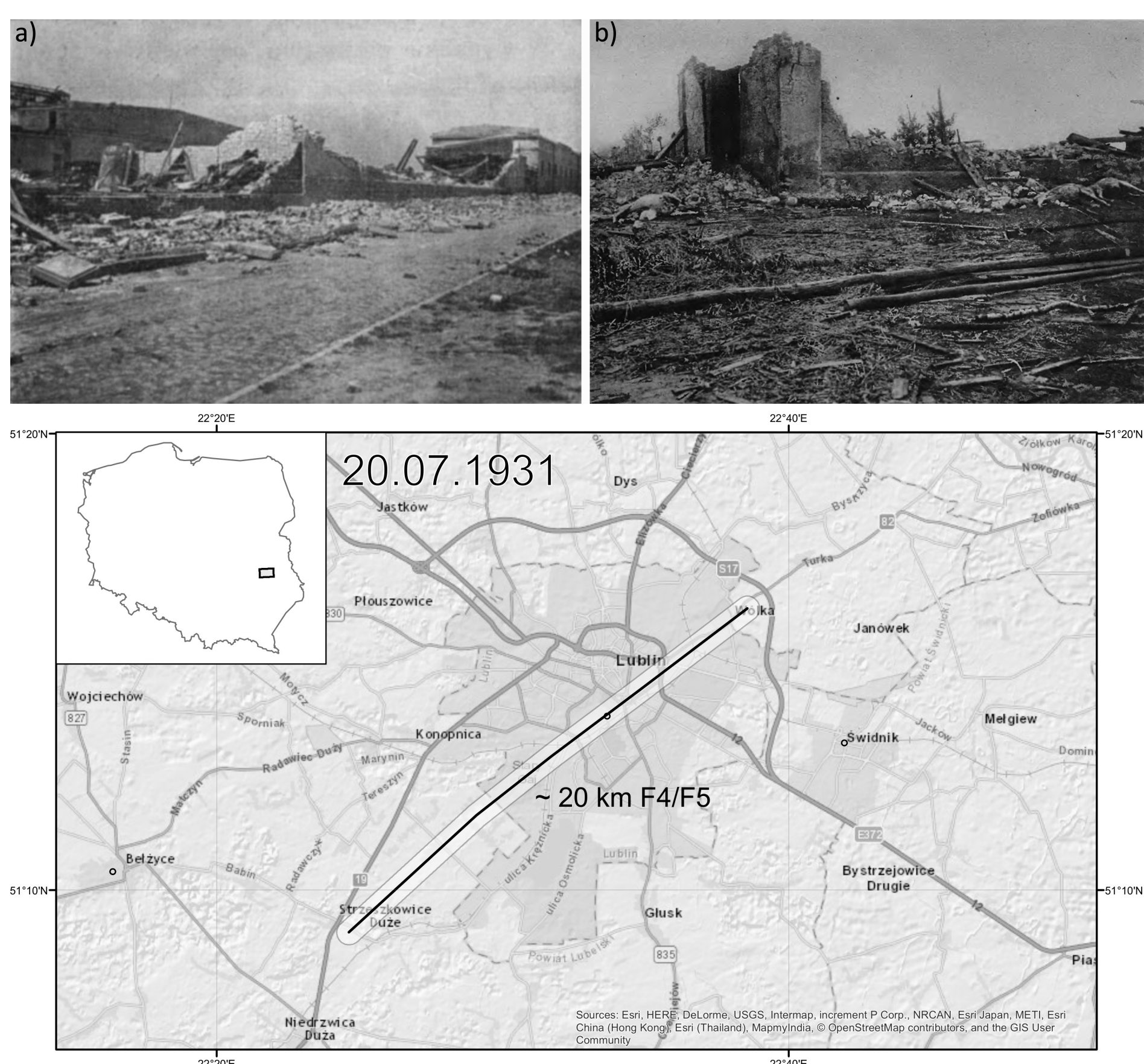
## Results

Study has shown that historical sources contain dozens of tornado reports, in some cases with information precise enough to reconstruct the tornado damage paths. In total, 26 newly identified tornado cases with fatalities were derived from historical sources and the information on 11 cases currently known was expanded. Although the analysis was under influence of temporal and spatial reporting inhomogeneities, several conclusions can be drawn:

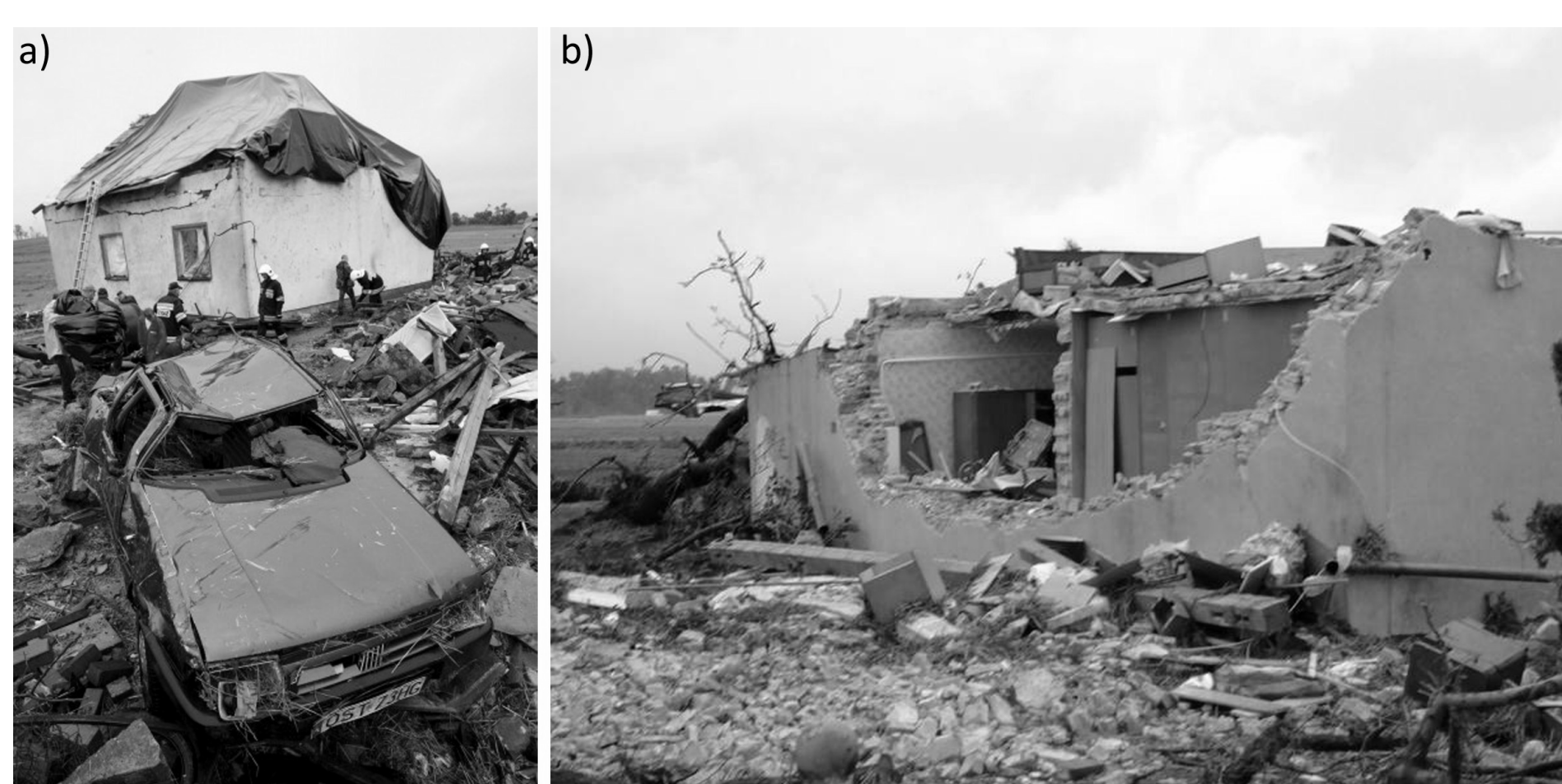
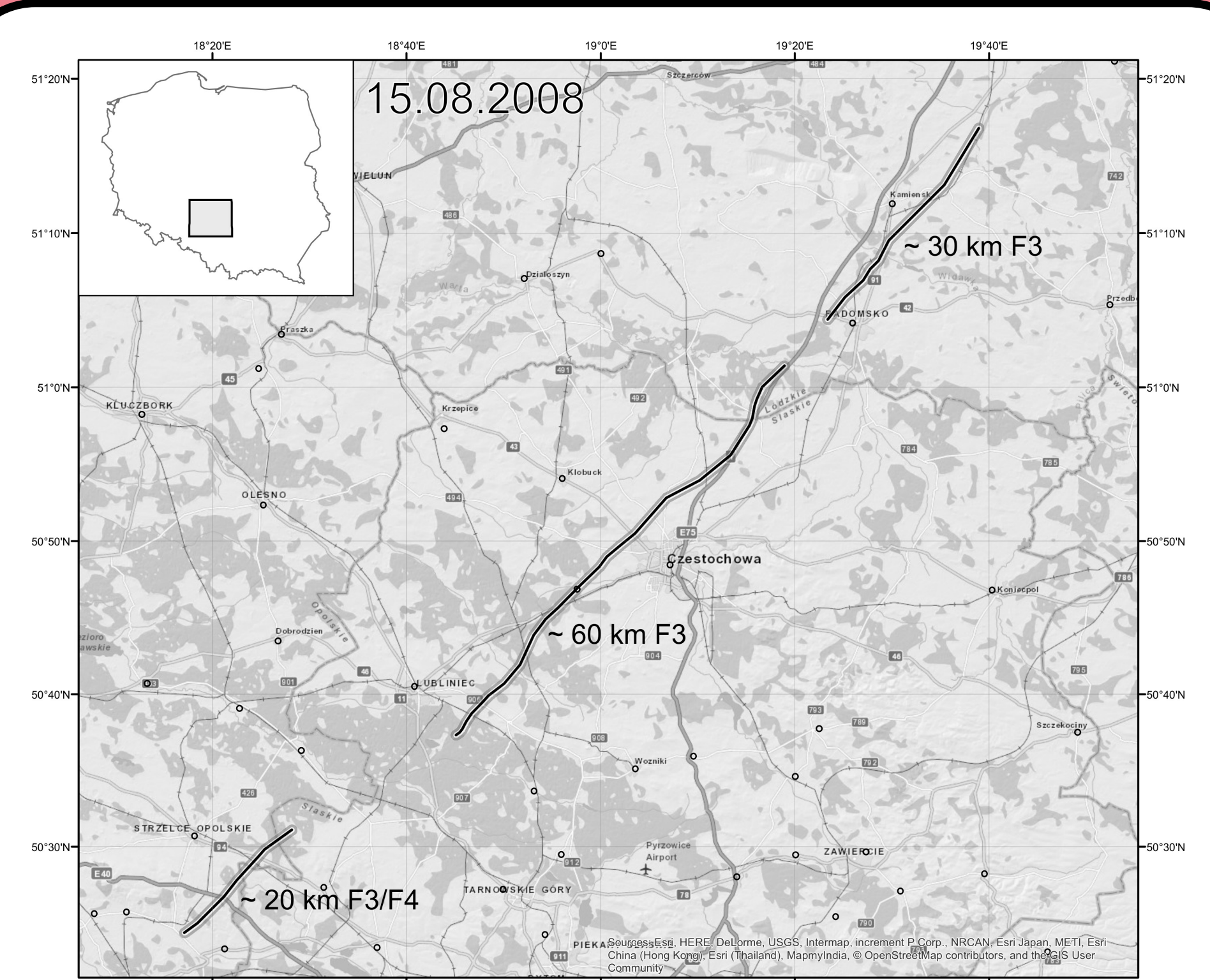
- An average of 1-2 killer tornadoes with 5 fatalities may be depicted for each decade.
- The majority of deaths and injuries were associated with members of the public being crushed by building (usually wooden barn) or hit by flying debris. Most of these cases took place in rural areas but some tornadoes did hit urban areas, causing a higher number of fatalities.
- Killer tornadoes occur most often from May to early August in the late afternoon hours which coincides with Groenemeijer and Kühne (2014) and Antonescu et al. (2016) on significant tornado occurrence in central Europe.
- A majority of tornado cases were associated with SW (53%) and W (24%) air advection.
- A noticeable fraction of tornado cases contained information about 5cm+ hail, which suggests the occurrence of supercells, which are known of producing such big hail.

## References

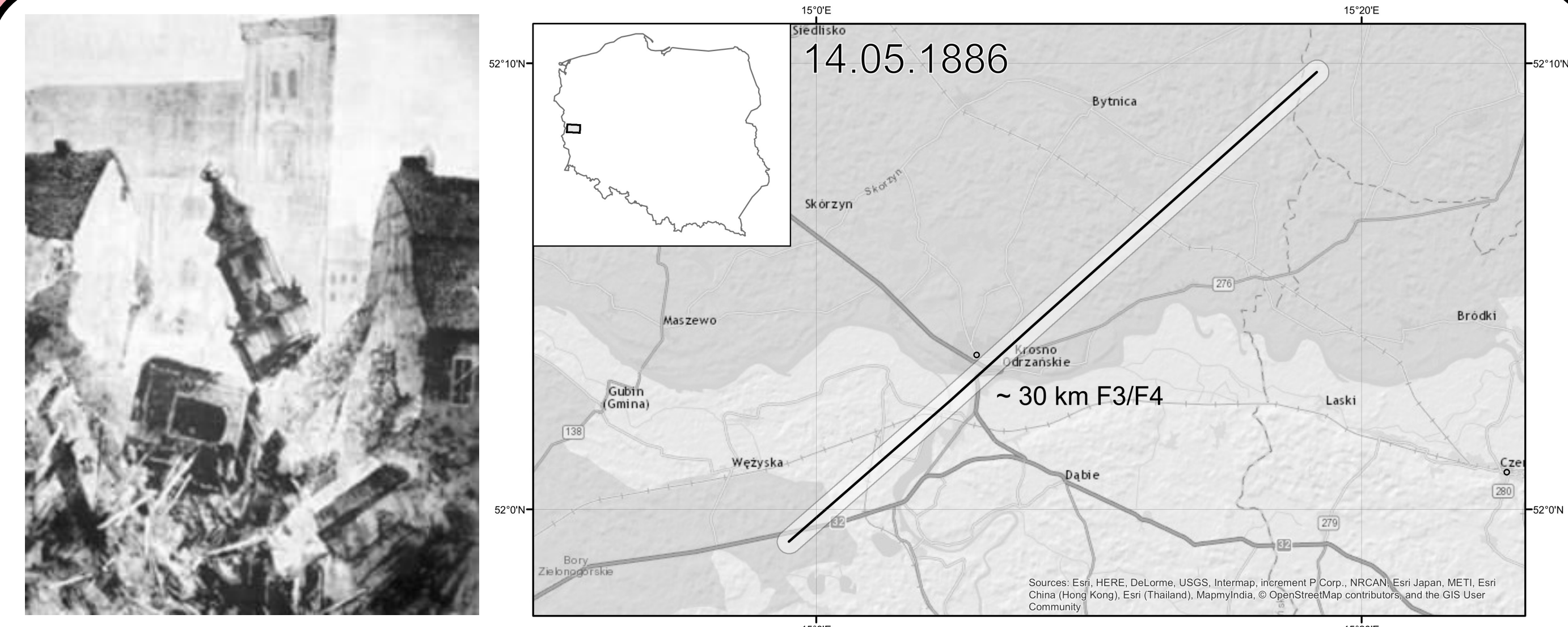
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Doswell, C. A., III, 2003: Societal impacts of severe thunderstorms and tornadoes: Lessons learned and implications for Europe. *Atmos. Res.*, **67-68**, 135-152.  
Groenemeijer, P. H., and T. Kühne, 2014: A climatology of tornadoes in Europe: Results from the European Severe Weather Database. *Mon. Wea. Rev.*, **142**, 4775-4790.  
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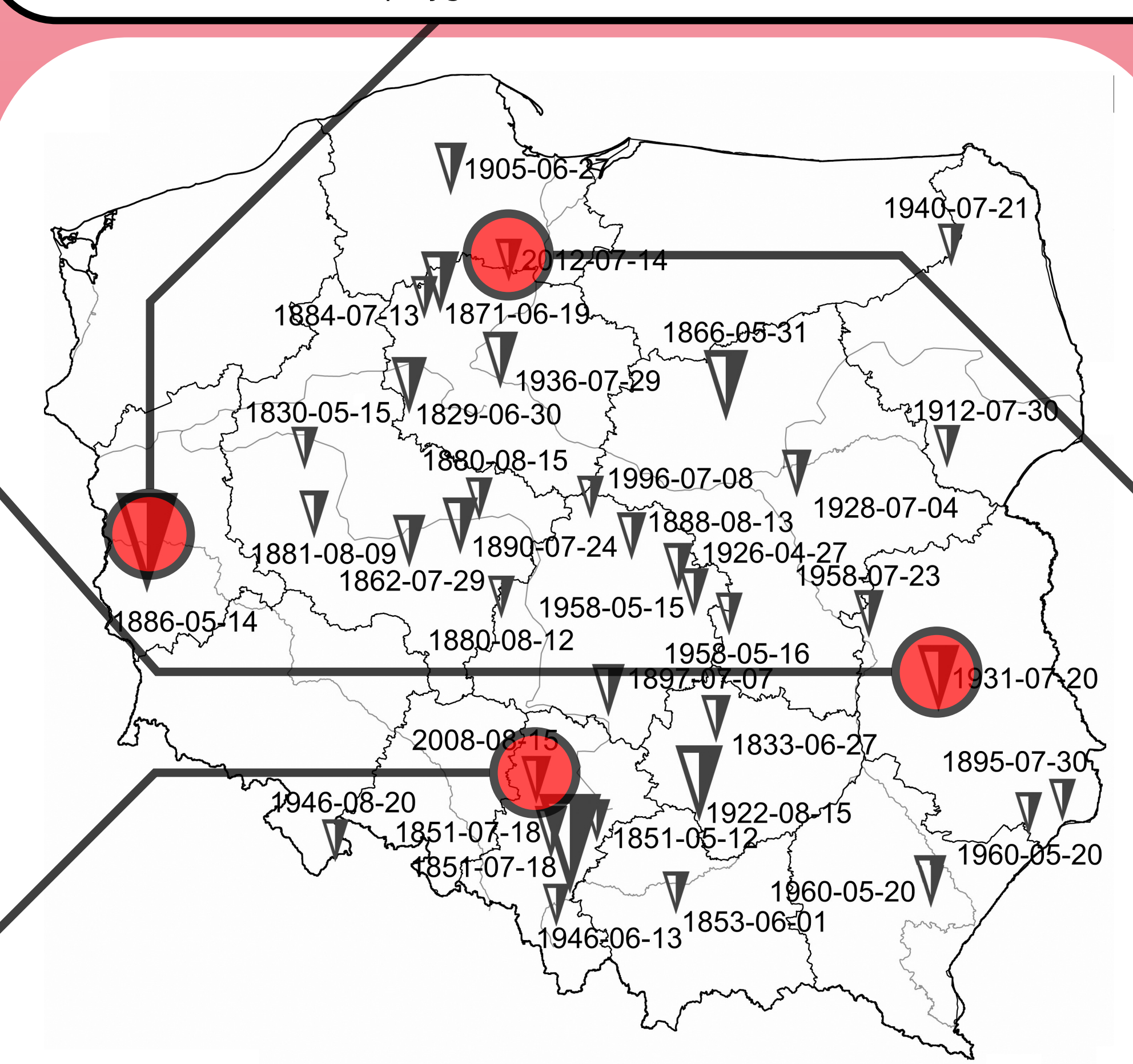
**Figure 1.** F4 damage due to tornado on 20 Jul 1931. (a) Slaughterhouse in Lublin and (b) brick cowshed in Tatary near Lublin. (at the bottom) Tornado damage track (solid black line) with 500m buffer zone (white polygon).



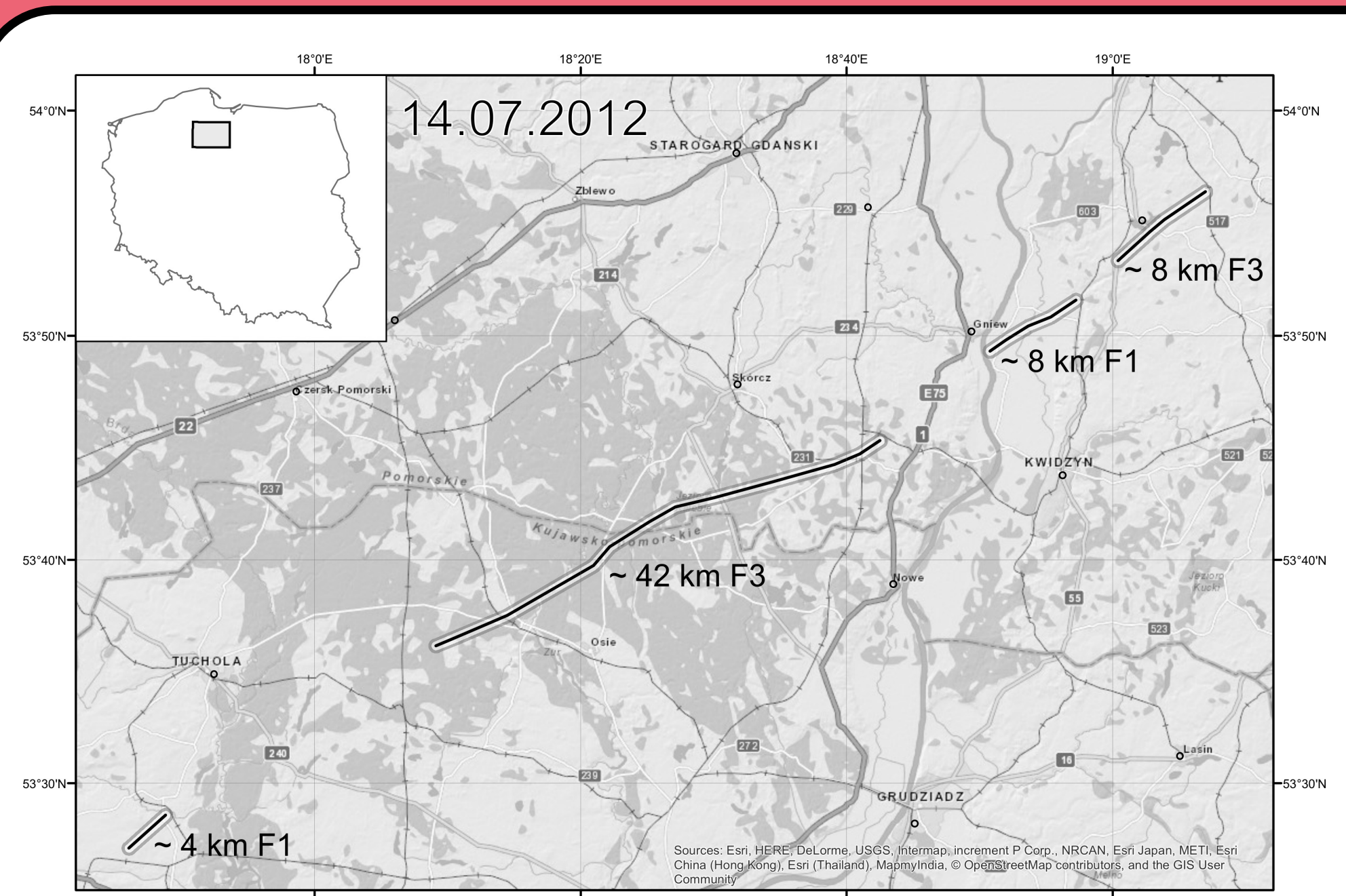
**Figure 2.** (a) Tornado damage near Balcerzowice (Photograph: A. Hawała), and (b) Sieronowice (Photograph: R. Dimitrow) on 15 Aug 2008. (at the top) Tornado damage tracks (solid black line) with 500m buffer zone (white polygon).



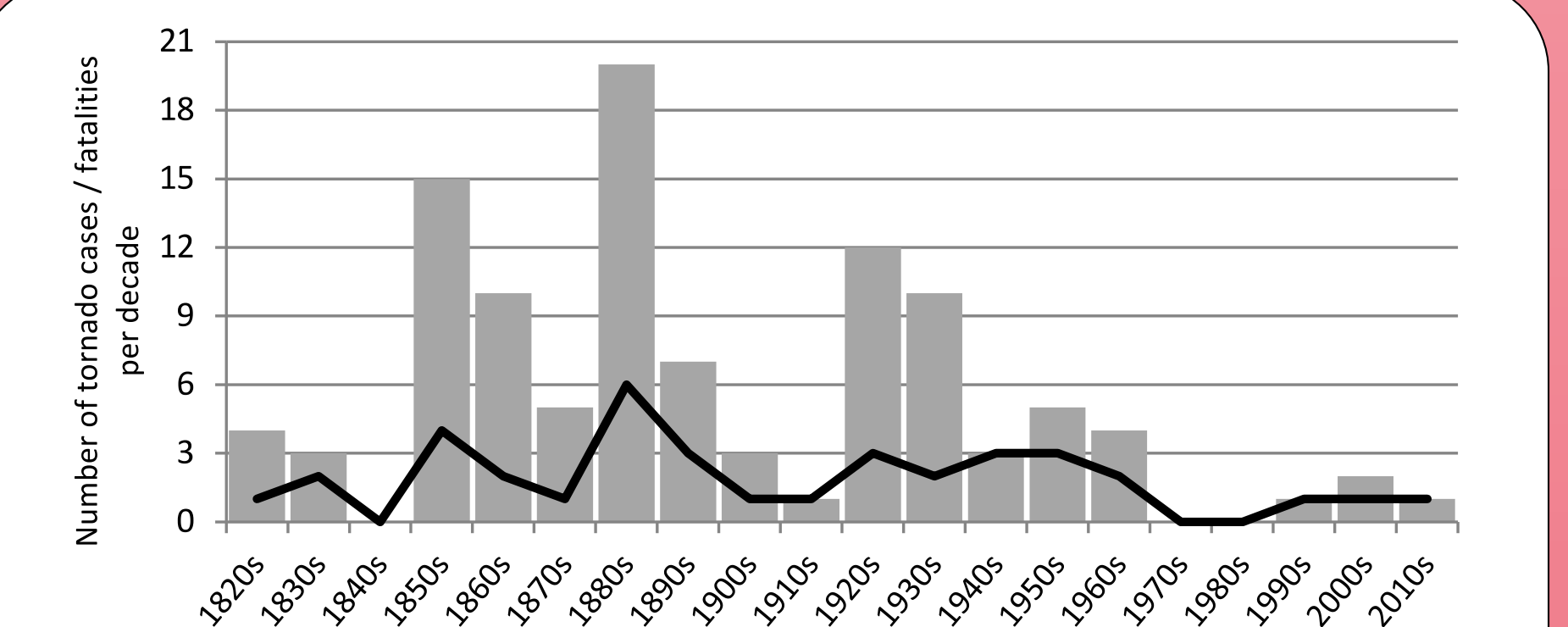
**Figure 3.** (on the left) Damage in Krosno Odrzańskie due to tornado on 14 May 1886. (Source: from the collection of Piast Castle in Gliwice, Poland). (on the right) Tornado damage track (solid black line) with 500m buffer zone (white polygon).



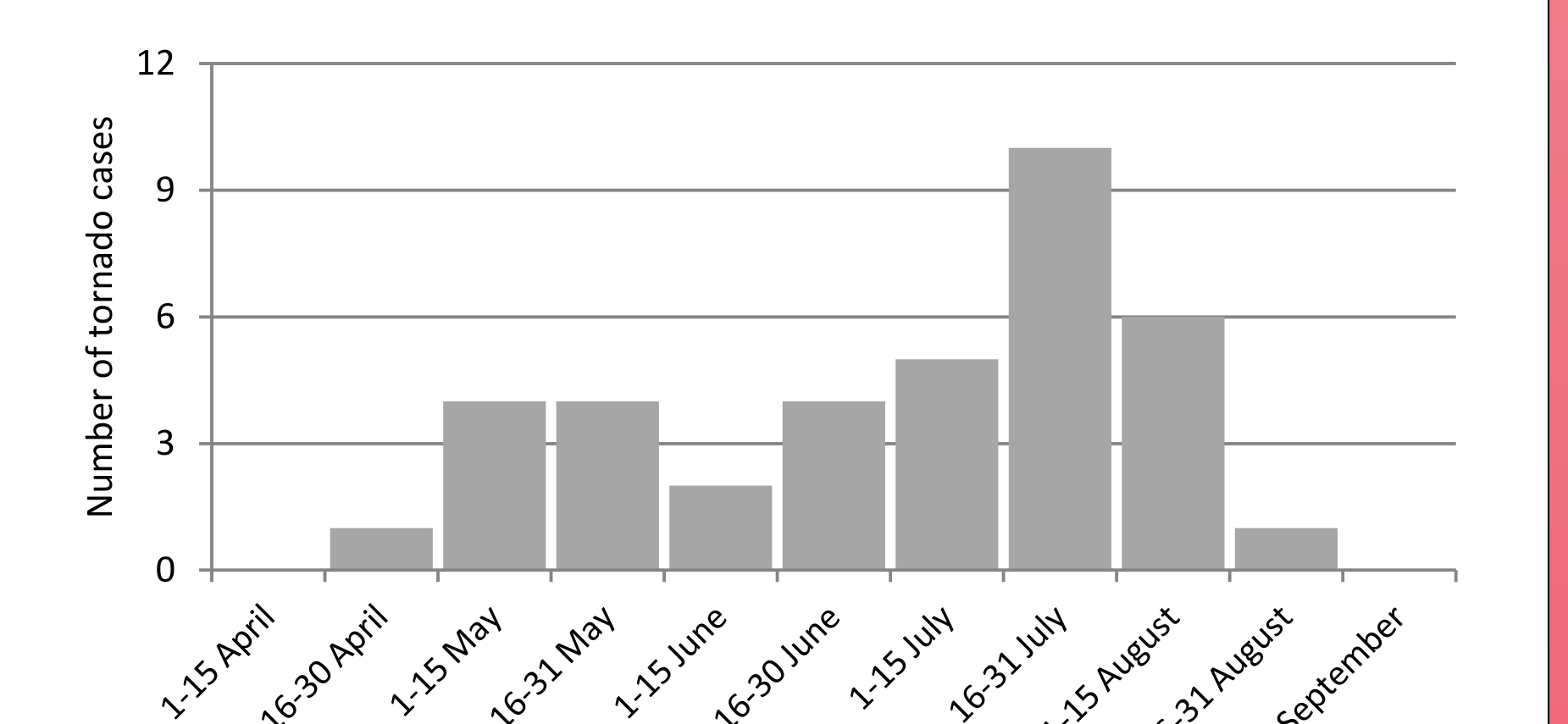
**Figure 4.** Spatial distribution of killer tornado cases in years 1820-2015. The size of the icon is matched to the number of fatalities (from 1 to 13).



**Figure 7.** (on the left) Tornado damage tracks (solid black lines) with 500m buffer zones (white polygons) on 14 Jul 2012. (on the right) Tornado passing through Kąlebie Lake near Wycinki (Photograph: B. Nawrotek).



**Figure 5.** A decadal number of tornado fatalities (bars) and killer tornadoes (linear plot) that occurred in Poland.



**Figure 6.** Annual distribution of killer tornadoes that occurred in Poland during the years 1820-2015.